

Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 3/20/2018 at 9:00 am.

Objective: Provide advice to the Water Operations Management Team (WOMT) and National Marine Fisheries Service (NMFS) on measures to reduce adverse effects from Delta operations of the Central Valley Project and the State Water Project on salmonids and green sturgeon. DOSS will work with other technical teams. DOSS notes and advice can be found at: http://www.westcoast.fisheries.noaa.gov/central_valley/water_operations/doss.html.

CDFW: Bob Fujimura, Jason Julienne, Ken Kundargi, and Duane Linander

DWR: Farida Islam, Kevin Reece, Dan Yamanaka, Bryant Giorgi, Mike Ford, Ming-Yen Tu

NMFS: Jeff Stuart, Kristin McCleery

Reclamation: Towns Burgess, Elissa Buttermore, Mike Hendrick Don Portz, Tom Patton

SWRCB: Chris Carr

USFWS: Craig Anderson

Agenda Items

1. Agenda review and introductions
2. RPA Implementation review (For the DOSS Dashboard, click on the "Triggers & Indices" tab at: www.baydeltalive.com/djfmj)
3. Current Operations
4. Smelt working group update
5. Fish Monitoring: RSTs/trawls/seines
6. Fish Monitoring: Salvage
7. Hatchery Releases
8. DOSS Estimates of Fish Distribution
9. DOSS Estimates of Fish Entrainment Risk
10. DOSS advice
11. Next DOSS meeting

Agenda Item 2.

RPA Implementation Review

Delta RPA Actions affecting operations during March:

Action IV.1.2¹ (DCC gate operations):

- Gates will remain closed from February 1 to May 20.

¹ For details, see pages 62-66 in Enclosure 2 of the 2011 Amendments to the 2009 RPA document at: http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf

Action IV.2.3² (OMR Management):

- Implementation of this action in WY 2018 is from 1/1/18 through 6/15/18, and requires that OMR flow be no more negative than -5,000 cfs. OMR flows are reported weekly with the OMR index and the tidally filtered USGS gauges at the 5-day and 14-day running averages.
- Daily older juvenile Chinook salmon loss density did not exceed the threshold of the first stage trigger of 2.5 fish/TAF during the past week.

Action IV.3³ (Reduce likelihood of entrainment or salvage at the export facilities, including an alert that indicates that export operations may need to be altered):

- Implementation of this action in WY 2018 is from 11/1/17 through 4/30/18.
- The third alert [March 1 through April 30: Knights Landing Catch Index (KLCI) or Sacramento Catch Index (SCI) >15] was not triggered during the past week.

Agenda Item 3.

Current Operations (3/20/18)

SWP		CVP	
Exports (cfs)			
Clifton Court Forebay	3,900	Jones Pumping Plant	2,700 (3 units)
Reservoir Releases (cfs)			
Feather - Oroville	1,050	American - Nimbus	1,750*
		Sacramento - Keswick	3,250
		Stanislaus - Goodwin	200
		Trinity - Lewiston	300
Reservoir Storage (in TAF)			
San Luis (SWP)	834	San Luis (CVP)	835
Oroville	1,635	Shasta	3,606
New Melones	1,935	Folsom	642
Delta Operations			
DCC	Closed	Sacramento River at Freeport (cfs)	25,200
Outflow Index (cfs)	~28,100	San Joaquin River at Vernalis (cfs)	2,800
E:I	30% (14-day avg.)	X2	69 km

*The last reduction in releases at Nimbus was cancelled due to the current weather forecast for rain and increased river inflows. Higher reservoir releases are expected later in the week due to encroachment into the flood control space in Folsom Reservoir.

² For details, see pages 74-79 in Enclosure 2 of the 2011 Amendments to the 2009 RPA document at: http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf

³ For details, see pages 79-80 in Enclosure 2 of the 2011 Amendments to the 2009 RPA document at: http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf

Approximate OMRs as of 3/17/18:

	USGS gauges (cfs)	Index (cfs)
Daily	-4,400	-5,000
5-day	-4,800	-4,800
14-day	-4,200	-4,200

Approximate OMRs as of 3/19/18:

	Index (cfs)
Daily	-5,000
5-day	-5,000
14-day	-4,300

Factors controlling Delta exports:

3/13-3/20: -5,000 cfs OMR limit per NMFS BiOp RPA Action IV.2.3

Weather Forecast

The weather forecast for the Sacramento region indicates light precipitation today with heavier precipitation continuing into the weekend. Snow level remains high until Saturday, when it will drop to 1,500-2,500 feet and significant snow accumulations are possible at higher elevations.

Agenda Item 4.

Smelt Working Group Update

The Smelt Working Group met on Monday, 3/19/18 at 10 am. Anderson (USFWS) provided a Smelt Working Group summary on the DOSS call. Chen (USFWS) distributed the following Smelt Working Group meeting summary via email:

The Smelt Working Group reviewed current Delta conditions, survey data, current water project operations, and forecasted weather. Current weather conditions are sunny and relatively warm, with a storm event forecasted for tomorrow through Thursday. The 3-station average water temperature (Antioch, Rio Vista Bridge, and Mossdale) has remained above 12°C since 3/8, which is the temperature indicative of spawning identified in the Biological Opinion and a trigger for the start of Action 3. One spawning female adult Delta smelt was detected this morning in the Deepwater Shipping Channel. OMR indices are currently at approximately -4,000 cfs and expected to be more negative and held at -5,000 cfs to up to -5,700 cfs for the rest of the week. Based on Delta conditions, water export levels, and the survey data, the Group concluded that Delta smelt entrainment risk would be high for OMR flows of more negative than -5,000 cfs, medium for OMR flows of -3,500 to -5,000 cfs, and low at OMR flows of more positive than -3,500 cfs.

Action 3 (protections for larval Delta smelt) has not been implemented yet as last week there were no biological or field indicators of spawning Delta smelt. The Smelt Working Group will continue to monitor Delta smelt survey and salvage data, Delta conditions, and this week’s forecasted precipitation. The Group will meet again next Monday, 3/26 at 10 am.

Agenda Item 5.

Fish Monitoring: The following table presents fish monitoring data summarized over the past week. Empty cells indicate zero catches at those locations with sample dates shown.

Location	GCID RST	Tisdale RST ^A	Knights Landing RST ^B	Butte Creek Fyke trap ^C	Butte Creek RST ^D	Beach Seines ^E	Sacramento Trawl ^E	Chippis Is. Midwater Trawl ^E	Mossdale Kodiak Trawl ^E
Sample Date	3/13*	3/8-3/19	3/8-3/19	2/28-3/19	3/2-3/19	3/12-3/13, 3/15-3/16	3/11, 3/13-3/15, 3/17	3/11, 3/13-3/15, 3/17	3/12, 3/14, 3/16
FR Chinook		40	5			75	59		1
SR Chinook		2	2	13,451	12,722	5	15		1
WR Chinook						2	5	4	2
LFR Chinook									
Chinook (ad-clip)		1 WR					5	3	3
Steelhead (wild)							1		
Steelhead (ad-clip)		1	4			1	4	3	
Green Sturgeon									
Flows (avg. cfs)		7,316	7,380 ^B	419	347				
W. Temp. (avg. °F)		53.5	54.4 ^B	40.7	40.5				
Turbidity (avg. NTU)		19.5	16.9 ^B	9.9	8.8				

* GCID trap was pulled on 3/13 due to recent release of hatchery winter-run Chinook salmon.

^A Tisdale RST sampling period was from 3/8 at 9:45 am to 3/19 at 9:30 am. The trap was pulled for repairs on 3/16 at 10:00 am and returned to the water on 3/17 at 9:30 am.

^B Knights Landing RST sampling period was from 3/8 at 10:30 am to 3/19 at 10:15 am. Turbidity meter not functioning on 3/9 and no flow data from CDEC on 3/18 and 3/19.

^C Butte Creek Fyke trap sampling period was from 2/28 at 9:30 am to 3/19 at 9:45 am. The fyke trap was pulled on 3/14 at 8:30 am to 3/18 9:30 am.

^D Butte Creek RST sampling period was from 3/2 at 8:30 am to 3/19 at 9:15 am. RST cone was raised from 3/12 at 9:00 am to 3/18 at 9:00 am.

^E Data reported in the 3/11 to 3/17 DJFMP sampling summary.

- Acoustic Receiver Data – Livingston Stone National Fish Hatchery juvenile winter-run Chinook salmon from brood year 2017
 - The first detection of released winter-run hatchery fish from release group #1 (on 3/2/18 in Redding, CA) occurred on 3/8/18 at the I-80/US-50 Bridge. To date (3/20/18), 58 fish from release group #1 have been detected at the Tower Bridge, and 57 fish at the I-80/ US-50 Bridge in Sacramento. This represents ~16% of the

total number of fish in the first release group, but does not include any losses due to predation or upstream mortality.

- The first detection of fish from release group # 2 (on 3/13/18 in Redding, CA) occurred on 3/18/18 at the I-80/US-50 Bridge. To date (3/20/18), 3 fish from release group #2 have been detected at the Tower Bridge, and 4 detections of release group #2 fish have been detected at the I-80/US-50 Bridge. This represents ~1.5% of the total number of fish in the second release group, but does not include any losses due to predation or upstream mortality.
- Overall, approximately 10% of the Brood Year 2017 winter-run hatchery fish released have moved downstream as far as Sacramento, however, this estimate does not include any losses due to predation or upstream mortality. The actual percentage of the population may be higher when survival information becomes available.

Agenda Item 6.

Fish Monitoring: Salvage⁴

Fujimura (CDFW) provided a salvage summary for the period of March 12-18, 2018.

The number of wild juvenile Chinook salmon salvaged last week decreased compared to the previous week: 4 winter-run, 4 spring-run, and 8 fall-run size (based on length-at-date criteria) Chinook salmon were salvaged.

The number of hatchery juvenile Chinook salmon salvaged last week markedly increased compared to the previous week: 4 winter-run, 81 spring-run, and 4 late fall-run size (based on length-at-date criteria) Chinook salmon were salvaged.

The number of wild steelhead markedly increased and the number of hatchery steelhead decreased. 105 wild steelhead and 56 hatchery steelhead were salvaged last week. Wild steelhead were salvaged most days last week and resulted in positive daily loss densities between 0.2 to 3.5 fish/TAF, which were below BO trigger levels.

No sturgeon were salvage last week.

Preliminary results for yesterday (3/19) indicate the Tracy Fish Collection Facility (TFCF) salvaged several hatchery juvenile Chinook salmon in the spring-run-size range and several wild steelhead. The SWP salvaged several wild steelhead and a hatchery steelhead and a wild Chinook salmon in the spring-run size range.

On 3/14, the Skinner Fish Protection Facility was inoperable for 1 hour due to power interruption. On the same day, the TFCF had a scheduled outage for about 30 minutes for maintenance inspection of their secondary channel.

⁴ Salvage data reported in this section represent the total estimated and expanded salvage based on the number of fish observed at the fish collection facility. For example, if one steelhead is observed in the typical ½-hour sampling period within a 2-hour operation period, the single steelhead is expanded to a salvage of four.

DOSS Weekly Salvage Update

Reporting Period: March 12-March 18, 2018

Prepared by Bob Fujimura on March 19, 2018 14:55

Preliminary Results -Subject to Revision

Criteria	12-Mar	13-Mar	14-Mar	15-Mar	16-Mar	17-Mar	18-Mar	Trend	
Loss Densities									
Wild older juvenile CS	0	0	0	0.26	0	0	0	↘	0.04
Wild steelhead	0	2.53	1.49	0.22	3.06	2.68	3.50	↗	1.93
Exports									
SWP daily export	4,165	5,734	5,968	6,758	7,931	6,260	6,988	↗	6,258
CVP daily export	5,404	5,423	5,341	5,568	5,293	5,279	5,229	↗	5,362
SWP reduced counts	0%	0%	0%	0%	0%	0%	0%	→	0%
CVP reduced counts	0%	0%	0%	0%	0%	0%	0%	→	0%

Loss Density = fish lost/TAF; water export = AF; Trend = compared to previous week; wild = adipose fin present

Loss = estimated number of fish lost at the CVP and SWP Delta export facilities based on estimated salvage (see below)

Reduced counts = percentage of time that routine salvage sample time were less than 30 min per 2 hours of salvage and export operations

Yellow highlighted dates indicate brief fish salvage interruptions occurred

Chinook Salmon Weekly/Season Salvage and Loss

Combined salvage and loss for both CVP and SWP fish facilities

Race determined by size at date of capture; hatchery = adipose fin missing;

Category	Weekly Total			Season Total	
	Salvage	Loss	Trend	Salvage	Loss
Wild					
Winter Run	4	3	↘	46	148
Spring Run	4	3	↗	4	3
Late Fall Run	0	0	→	1	4
Fall Run	8	20	↗	36	40
Unclassified	0	0	↘	4	NC
Total	16	25		91	195
Hatchery					
Winter Run	4	18	→	28	111
Spring Run	81	130	↗	101	148
Late Fall Run	4	3	↗	63	216
Fall Run	0	0	→	0	0
Unclassified	0	0	→	1	NC
Total	89	151		193	475

Trend = weekly loss per race; Salvage = estimated number of fish collected by the CVP and SWP fish protective facilities per unit of time

NC = cannot be calculated; hatchery salmon salvage and loss estimates have been corrected using CWT readings when available

Steelhead Weekly/Season Salvage and Loss

Combined salvage and loss for both CVP and SWP fish facilities

Category	Weekly Total			Season Total	
	Salvage	Loss	Trend	Salvage	Loss
Wild	105	162	↗	133	254
Hatchery	56	110	↘	351	1,148
Total	161	272		484	1,401

State Water Project loss = salvage x 4.33; Central Valley Project loss = salvage x 0.68

Generated by Bob Fujimura on March 19, 2018

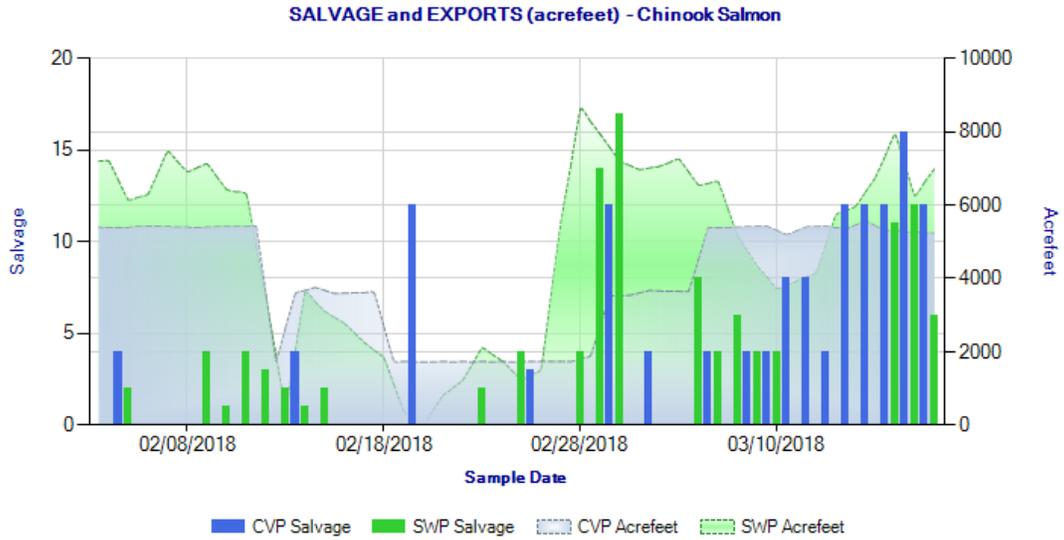


Figure 1. Daily salvage of Chinook Salmon (all races) and water exports from the state and federal fish salvage facilities during February 4 through March 18, 2018. Graph obtained from the DFG salvage monitoring web page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

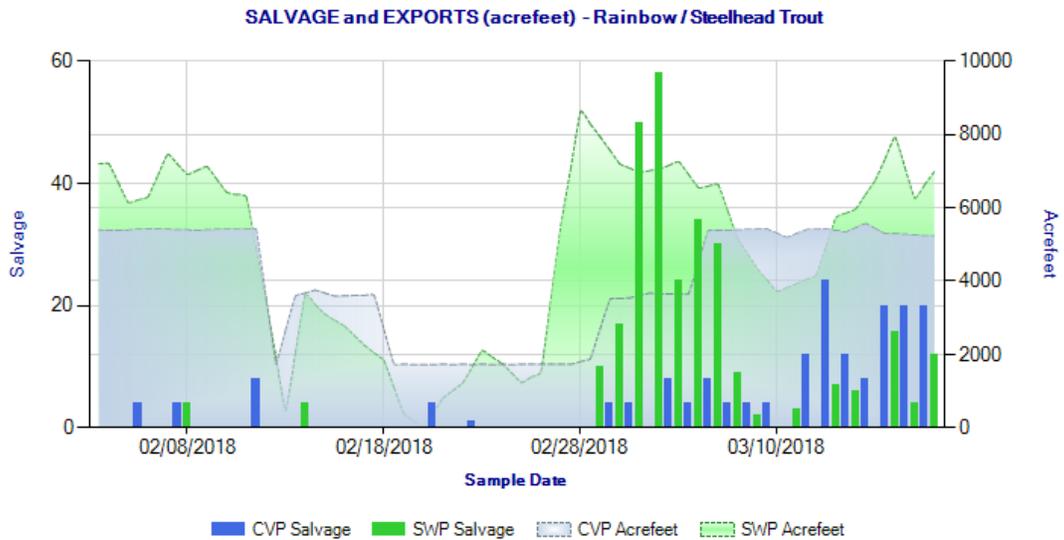


Figure 2. Daily salvage of Rainbow/Steelhead and water exports from the state and federal fish salvage facilities during February 4 through March 18, 2018. Graph obtained from the DFG salvage monitoring web page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

CONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES as of 3/15/18

Release Date	CWT Race	Hatchery	Release Site	Release Type	Confirmed Loss	Number Released ¹	Total Entering Delta	% Loss of Number Released ²	% Loss of Total Entering Delta ³	First Stage Trigger	Date of First Loss ⁴	Date of Last Loss ⁴
12/21/2017	LF	Coleman NFH	Battle Creek	Production	20.31	297,370	n/a	0.007	n/a	n/a	1/23/2018	2/23/2018
1/5/2018	LF	Coleman NFH	Battle Creek	Production	131.39	519,791	n/a	0.025	n/a	n/a	1/31/2018	3/2/2018
1/8/2018	LF	Coleman NFH	Battle Creek	Spring Surrogate	8.66	78,786	n/a	0.011	n/a	0.5%	1/31/2018	2/1/2018
1/19/2018	LF	Coleman NFH	Battle Creek	Spring Surrogate	0	71,645	n/a	0.000	n/a	0.5%	*	*
1/25/2018	LF	Coleman NFH	Battle Creek	Spring Surrogate	16.87	84,922	n/a	0.020	n/a	0.5%	*	3/8/2018
12/21/2017	S	SJRRP	San Joaquin River	Experimental	13.16	1450	n/a	0.908	n/a	n/a	1/11/2018	3/13/2018
1/19/2018	S	SJRRP	San Joaquin River	Experimental	5.3	210	n/a	2.524	n/a	n/a	3/14/2018	3/15/2018

UNCONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES, 2017/2018

Facility	Unknown CWT Loss ⁵	Unread CWT Loss ⁶	Unknown Hatchery Loss ⁷	Acoustic Tag Loss ⁸	Number of Unassigned CWTs ⁹
SWP	99.29				
CVP					
TOTAL	99.29				

SWP and CVP adipose-fin clipped Chinook lost from 10/1/2017 through 3/15/2018.

¹Number released with the adipose-fin clipped and a coded-wire tag (CWT).

²% Loss of Number Released = (Confirmed Loss/Number Released)*100.

³% Loss of Total Entering Delta= (Confirmed Loss/Total Entering Delta)*100.

⁴Date of first and last loss accounts for all CWT loss even those from special studies where salvage and loss=0.

⁵Adipose-fin clipped Chinook was observed during fish count, but tag code could not be determined (e.g., damaged tag, lost tag, no tag, or Chinook released).

⁶Adipose-fin clipped Chinook was collected during fish count and has not been processed yet.

⁷CWT has been read, but hatchery release information not yet available.

⁸Adipose-fin clipped Chinook released due to presence of sutures.

⁹CWT cannot currently be assigned to a salvage record with certainty since the CWT was lost and then found. CWT may be assigned to a salvage record if new information is available.

¹⁰Chinook outside of the length-at-date criteria (Delta model) are not reported.

** Information not yet available.

DWR-DES Revised 3/16/2018

Preliminary data from DFW, DWR, FWS, and Reclamation; subject to revision.

Agenda Item 7.

Hatchery Releases

The USFWS distributed a notification for the release of 67,396 hatchery produced winter-run Chinook salmon from the Livingston Stone National Fish Hatchery into the North Fork Battle Creek on 3/16. These fish are the progeny of captive broodstock from the Livingston Stone National Fish Hatchery brood year 2017. All fish are 100% coded wire tagged (CWT), ad-clipped, and left pelvic-fin clipped.

Agenda Item 8.

DOSS Estimates of Fish Distribution

DOSS estimates of the current distribution of listed Chinook and steelhead, as a percentage of the population, are based on recent monitoring data and historical migration timing patterns.

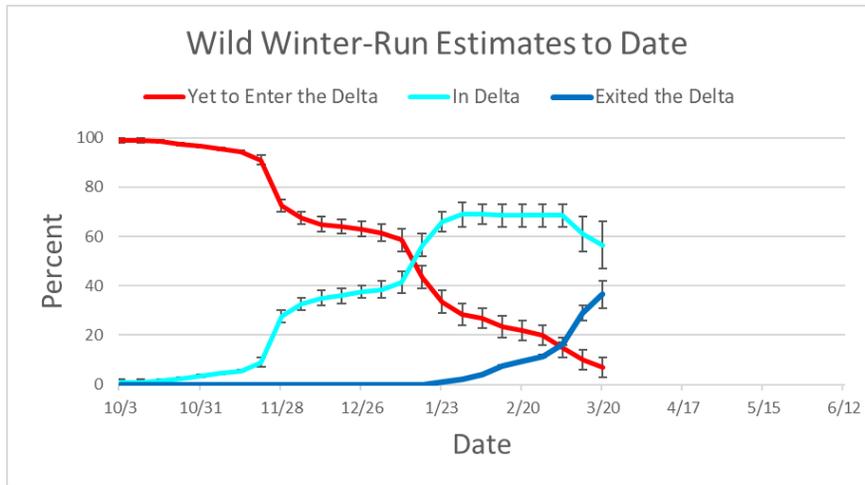
Location	Yet to Enter Delta (Upstream of Knights Landing)	In the Delta	Exited the Delta (Past Chipps Island)
<i>Wild young-of-year winter-run Chinook salmon</i>	3-11% (Last week: 6-14%)	47-66% (Last week: 54-68%)	31-42% (Last week: 26-32%)
<i>Wild young-of-year spring-run Chinook salmon</i>	15-25% (Last week: 18-36%)	75-85% (Last week: 64-82%)	0% (Last week: 0%)
<i>Hatchery winter-run Chinook salmon</i>	85-90%	10-15%	0%

Rationale for changes in distribution

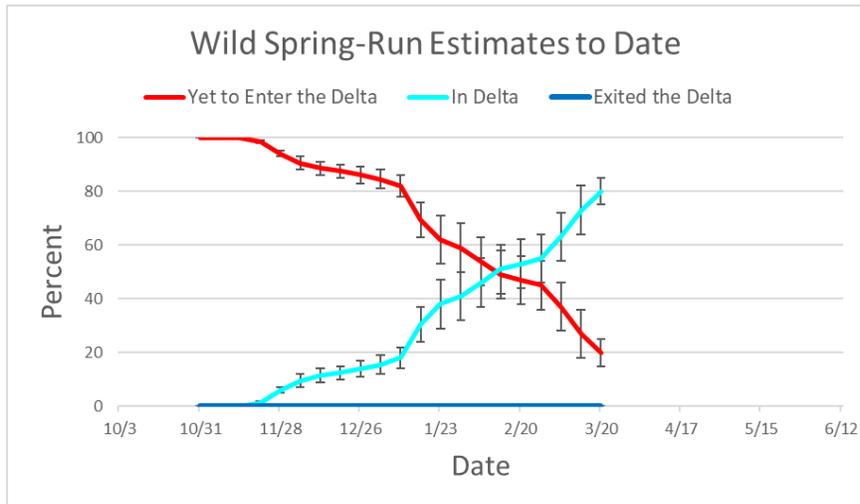
Wild winter-run Chinook: 2 winter-run sized fish were observed at the beach seines, 5 at Sacramento Trawl, and 4 at Chipps Island this past week. Since more fish were observed at monitoring locations, including 4 at Chipps Island, DOSS estimated that an additional 3% of the winter-run population has moved into the Delta, and 5-10% have exited past Chipps Island.

Wild spring-run Chinook: 2 spring-run sized fish were observed at Tisdale, over 26,000 at Butte Creek, 5 in the beach seines, 15 at Sacramento Trawl, and 1 at Mossdale this past week. Since more fish were observed at locations upstream and within the Delta and none were observed exiting at Chipps Island, DOSS estimated that an additional 3-11% of the spring-run population has moved into the Delta. There is also the potential that some of the fish classified as spring-run by the length-at-date criteria may actually be late emerging and slow growing winter-run Chinook salmon. Cooler river water temperatures this year may have delayed spawning and slowed the emergence and growth of winter-run fry in the upper Sacramento River, and thus these fish would fall into the size criteria for spring-run at this time of year. Likewise, some spring-run may fall into the fall-run length-at-date size criteria due to slow growth in cooler waters.

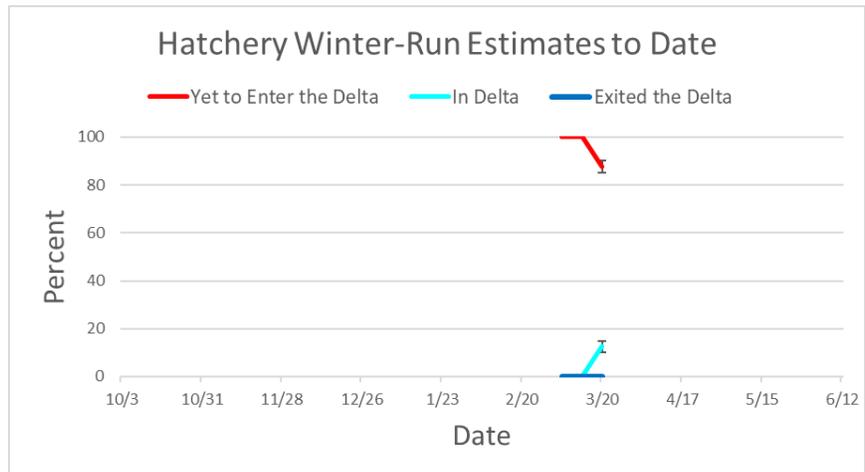
Hatchery winter-run Chinook: Based on real time monitoring of hatchery winter-run at Tower Bridge and the I-80/50 Bridge, DOSS estimated that 10-15% have entered the Delta. This estimate assumes a high in-river survival rate but does not account for predation or other sources of mortality.



WY 2018 wild winter-run distribution estimates to date.



WY 2018 wild spring-run distribution estimates to date.



WY 2018 hatchery winter-run distribution estimates to date.

Agenda Item 9.

DOSS Feedback on Entrainment Risk

DOSS provides weekly entrainment risk outlooks by considering (a) two different categories of entrainment risk based on listed fish distribution and (b) factors that influence their potential for entrainment. The two entrainment risk categories considered include:

- **Interior Delta Entrainment Risk**- fish in the Sacramento River that have the potential to be entrained into the Interior Delta through the Delta Cross Channel (when open) and/or Georgiana Slough; and
- **CVP/SWP Facilities Entrainment Risk**- fish in the Interior Delta that have the potential to be entrained into the CVP/SWP facilities.

Influencing factors considered include:

- **Exposure Risk** (both categories)- estimated scale (low, medium, high) of fish anticipated to be in vicinity of an entrainment risk,
- **Routing Risk** (Interior Delta Entrainment Risk)- estimated scale (low, medium, high) that flow split conditions could result in fish migrating into the interior delta instead of remaining in main channel, and
- **OMR/Export Risk** (CVP/SWP Facilities Entrainment Risk)- for fish in the Interior Delta, estimated scale (low, medium, high) that OMR and/or Export levels could result in entrainment into the CVP/SWP facilities.

To provide an overall assessment of entrainment risk, the estimated current status of these influencing factors are described below for each of the entrainment risk categories.

Interior Delta Entrainment Risk for listed salmonids in the Sacramento River over the next week:

- **Exposure Risk: HIGH**
 - Approximately 90% of the winter-run Chinook salmon population has moved downstream into the Delta or have already exited past Chipps Island.
 - Hatchery production winter-run releases have occurred and acoustically-tagged fish are beginning to be detected by Sacramento area receivers.
 - Winter-run Chinook salmon have been observed at the salvage facilities (DNA verified).
 - Spring Kodiak Trawl data also indicate winter-run are in the central and western Delta.
 - Increased flows and turbidities from recent storms are expected to stimulate fish movement.
 - Winter-run continue to be present in the Delta and are likely to continue rearing there for the next several weeks, elevating their exposure risk.
 - Approximately 90% of winter-run Chinook salmon population is downstream of Knights Landing at this time. A few winter-run have been seen in the lower Sacramento River section between Sacramento and DCC and several winter-run have been observed in the catch at Chipps Island over the past few weeks, indicating that most of the population is in the Delta and not upstream, and that

increasing numbers are beginning to move out of the Delta past Chipps Island (31-42% of the population)..

- Approximately 75-85% of spring run population is in Delta.
 - Surrogate spring-run Chinook salmon hatchery releases of late-fall run Chinook salmon are in the system. The last release occurred on 1/25/18. CWTs from captured ad-clipped Chinook salmon are being read from fish collected during monitoring.
 - Wild and hatchery Chinook salmon and steelhead have been observed in the Chipps Island trawls.
 - Wild and hatchery Chinook salmon have been observed in beach seines from the North Delta and Liberty Island regions.
 - Wild and hatchery Chinook salmon as well as hatchery steelhead have been observed in the EDSM efforts.
 - Wild and hatchery salmonids have been observed in salvage.
- **Routing Risk: MEDIUM**
 - River flows are not high enough to mute tidal influence at Georgiana Slough and Three Mile Slough, allowing redirection of fish into these routes on flood tides.
 - Delta Cross Channel is closed.
 - **Overall Entrainment Risk: MEDIUM-HIGH**
 - Increased movement of winter-run Chinook salmon, spring-run Chinook salmon, and steelhead into the Delta and remaining within the Delta increase overall risk of entrainment into the interior Delta.

CVP/SWP Facilities Entrainment Risk for listed salmonids in the Interior Delta over the next week:

- **Exposure Risk: HIGH**
 - Hatchery and wild steelhead have been observed in salvage.
 - Hatchery and wild Chinook salmon have been observed in salvage.
 - Continuing to see Chinook salmon and steelhead in lower Sacramento River and western Delta monitoring efforts (Chipps Island and in the river confluence region).
 - Greater proportions of winter-run and spring-run Chinook salmon populations are estimated to have moved into the Delta than remain upstream.
- **OMR/Export Risk:**
 - OMR -2,500 cfs: LOW-MEDIUM
 - OMR -3,500 cfs: MEDIUM
 - OMR -5,000 cfs: MEDIUM-HIGH
 - OMR -6,250 cfs⁵: HIGH
 - OMR -7,500 cfs⁵: HIGH (incrementally higher risk if Vernalis flows decrease)

⁵By request of management, DOSS also assessed risks at an OMR flow more negative than -5,000 cfs.

- OMR -9,000 cfs⁵: HIGH (Full export capacity, footprint of export effects extend into western Delta and lower San Joaquin River).
- **Overall Entrainment Risk:**
 - OMR -2,500 cfs: MEDIUM-HIGH
 - OMR -3,500 cfs: MEDIUM-HIGH
 - OMR -5,000 cfs: MEDIUM-HIGH (similar to last week due to fish presence)
 - OMR -6,250 cfs⁵: HIGH
 - OMR -7,500 cfs⁵: HIGH
 - OMR -9,000 cfs⁵: HIGH

These assessments are based on current hydrology and fish distributions.

Agenda Item 10.

DOSS Advice to WOMT and NMFS:

Due to the recent and projected increased river flows resulting from the forecasted series of storms coming into Northern California, DOSS thinks that there is an additional elevated risk of entraining hatchery-produced winter-run Chinook salmon at the Federal and State fish facilities, in addition to the already increased risk of entrainment for wild and hatchery produced salmonids in the Delta. Multiple detections of acoustically-tagged hatchery winter-run Chinook salmon at the Sacramento area receivers indicate that approximately 10% of the hatchery releases are as far downstream as Sacramento at this time, with entry into the rest of the Delta likely occurring in the near future. Increased presence of listed salmonids, including hatchery winter-run, in the Delta increases the risk of entrainment into the interior Delta and potential future exposure to the SWP and CVP fish collection facilities. DOSS advises that OMR flows more negative than -5,000 cfs will have high overall entrainment risks at the CVP and SWP fish salvage facilities given current wild and hatchery winter-run Chinook salmon distributions, and recent salvage and loss of unclipped steelhead. OMR flows more negative than -5,000 cfs will create conditions that are not protective of listed salmonids in the southern Delta.

Agenda Item 11.

Next Meeting: The next DOSS conference call will be on **3/27/2018 at 9 am.**